

Space Weather Forecast

Issued on Saturday, 19 February 2022 at 01:03 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: G1/Minor geomagnetic storm intervals likely into the new week.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Very Low over the past 24 hours. There are currently five sunspot groups on the visible disc, which are small and relatively stable. The most complex sunspot region was inactive and is located in the southern hemisphere, near centre disc. No Earth-directed Coronal Mass Ejections (CMEs) were in evidence in available satellite imagery in the past 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind, was characterised by a slow regime, but with a rising trend in most measures. The cause of this is uncertain, but may be related to a close pass by a minor CME, for the lack of any forecast coronal hole fast wind. The magnetic field ranged from weak to moderate. The all important north-south orientation was mostly positive (northward), but declined to a weakly negative (southward) orientation during Friday evening. The net result of the above solar wind measures was mostly Quiet, with an Unsettled interval observed 18/1800-2100 UTC, possibly due to a close passing CME, although confidence is low in regards to this aspect.

Energetic Particles / Solar Radiation: The high energy proton flux (related to solar radiation storms) has tracked very slightly above background levels since around 12 hours after an evidently very large and energetic X-ray flare and CME seen on satellite imagery from the rearward eastern solar hemisphere on 15 February. This is unlikely to rise any further.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to be low at first given the sparsely populated Earth-facing side of the sun, however there are indications that a large and potent region (responsible for the solar radiation mentioned above) may rotate onto the Earth-facing side into the new working week. The magnitude of this increase will be assessed when the spot responsible becomes visible to analyse.

Solar Wind / Geomagnetic Activity: No CMEs feature in this forecast period. Solar winds should remain in a slow regime until the possible onset of a pair of 'coronal hole' fast wind streams in succession over the second half of the four-day period, giving likely G1 Minor Storm intervals on Sunday 20 February, and a chance of continuation on Monday, else being largely quiet.

Energetic Particles / Solar Radiation: No solar radiation storms are expected during the period, with the very slightly disturbed high energy proton trace relaxing through the period.

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	1	60	40	10
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	No	5	5	5	5
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)